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Selective increase in blood-tumor barrier permeability by calcium antagonists in transplanted rat brain tumors.

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To clarify the altered response of calcium antagonists on pathological vessels, we investigated the effect of intracarotid infusion of nifedipine on the blood-brain barrier (BBB) permeability using a rat glioma model. Animals were treated with 0, 0.1, 1, 5, and 10 micrograms/kg/min of intracarotid continuous infusion of nifedipine. 2% Evans blue (EB, 2 ml/kg) was injected intravenously immediately after nifedipine infusion. BBB and blood-tumor barrier (BTB) permeability were evaluated by direct visual and histological observation. During the entire experiment, systemic parameters such as arterial blood pressure and blood analysis were not changed significantly. There was a dose-dependent increase of EB permeability selectively in the tumor tissue without affecting the normal brain. These results indicate that tumor vessels may show an altered response to calcium antagonists. Intracarotid administration of calcium antagonists contribute to a selective enhancement of drug delivery to malignant brain tumors without affecting the normal brain.

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